Surge-MASTER

BY EMB MFG INC.

EMB Manufacturing Inc.
4144 Boomer Line · St. Clements, On · N0B 2M0 · Canada
Ph: (519) 699-9283 · Fax: (519) 699-4146
www.surgemaster.ca www.embmfg.com

SM32S

CHIPPER-SHREDDER
MODEL SM32S

OPERATOR'S MANUAL

PRINTED IN CANADA
Rev: 231211
PART NUMBER: Z97070

TABLE OF CONTENTS

WARRANTY **3**
INSPECTION REPORT **4**
SERIAL NUMBER LOCATION **5**
1 INTRODUCTION **6**
2 SAFETY **7**
2.1 GENERAL SAFETY 8
2.2 EQUIPMENT SAFETY GUIDELINES 9
2.3 SAFETY TRAINING 10
2.4 SAFETY SIGNS 10
2.5 PREPARATION 11
2.6 MAINTENANCE SAFETY 11
2.7 OPERATING SAFETY 12
2.8 REFUELLING SAFETY 12
2.9 STORAGE SAFETY 12
2.10 GAS MOTOR SAFETY 13
2.11 SIGN-OFF FORM 14
3 SAFETY SIGN LOCATIONS **15**
4 OPERATION **16**
4.1 TO THE NEW OPERATOR OR OWNER 16
4.2 MACHINE COMPONENTS 17
4.3 MACHINE BREAK-IN 18
4.4 PRE-OPERATION CHECKLIST 18
4.5 CONTROLS 19
4.6 FIELD OPERATION 21
4.7 STORAGE 26
4.7.1 PLACING IN STORAGE 26
4.7.2 REMOVING FROM STORAGE 26
5 SERVICE AND MAINTENANCE **27**
5.1.1 FLUIDS AND LUBRICANTS 27
5.1.2 GREASING 27
5.1.3 SERVICE ILLUSTRATION 28
5.1.4 SERVICE RECORD CHART 29
5.2 MAINTENANCE 30
5.2.1 BELT TENSION / ROTOR BRAKE: 30
5.2.2 MULCHING SCREEN: 31
5.2.3. BLADE, KNIFE AND BREAKER MAINTENANCE: 32
6 TROUBLE SHOOTING **36**
6.1 TROUBLE SHOOTING CHART 36
7 SPECIFICATIONS **38**
7.1 MECHANICAL 38
7.2 BOLT TORQUE 39
8 ACCESSORIES **40**
INDEX **41**

WARRANTY

Effective on products retailed on or after September 1, 2011.

Register your product online at www.surgemaster.ca within 30 days of purchase to activate warranty.

This product is warranted to be free of defects in materials and workmanship under normal use and service, for a period of

Three (3) Years for Consumer
One (1) Year for Commercial/Rental

from the date of purchase, when operated and maintained in accordance with the Operating and Maintenance Instructions supplied with this unit. Warranty is limited to the repair of the product and/or replacement of parts.

This warranty does not cover the following items:

1) Parts lost or damaged during shipment,
2) Normal maintenance or adjustments
3) Normal replacement of service items.
4) Accessory items / parts not supplied by EMB MFG INC.
5) Damages resulting from:
   - misuse, negligence, accident, theft or fire
   - use of improper or insufficient fuel, fluids or lubricants
   - use of parts or after market accessories other than genuine EMB MFG INC. parts
   - modifications, alteration, tampering or improper repair performed by parties other than an authorized servicer
   - any device or accessories installed by parties other than an authorized EMB servicer

Engines are covered by the manufacturer of the engine and covered by the warranty period specified by that manufacturer. **Engine warranty must be registered at the engine manufactures website.** For service contact your local engine dealer.

Under no circumstances will the manufacturer be liable for any consequential damage or expense of any kind, including loss of profits. The manufacturer is under no circumstances liable for tow vehicle of any kind. The manufacturer is not liable for the maintenance of the product.

This warranty is extended only to the original purchaser and is not transferable. Warranty is void if repairs are attempted by anyone other than an authorized service centre.

If a difficulty develops with the product, contact EMB MFG INC. Only our authorized service centres may make repairs to the product or affect the replacement of defective parts, which will be done at no charge within a reasonable time after the receipt of the product. Unit or parts shall be returned at the customer's expense to the authorized service centre. Damage in transit is not covered by warranty. **Include the original purchase receipt with any claim** (keep a copy of the receipt for your files).

The distributor's liability under warranty is limited to the repair of the product and/or replacement of parts and is given to the purchaser in lieu of all other remedies including incidental and consequential charges. There are no warranties, expressed or implied, other than those specified herein.

EMB MFG Inc
4144 Boomer Line, St Clements, ON N0B 2M0 Canada
Phone: 519-699-9283 Fax: 519-699-4146 : attention to Warranty Dept
Email: warranty@embmfg.com

rev.091111

WARRANTY IS VOID IF NOT REGISTERED

Surgemaster

CHIPPER SHREDDER

INSPECTION REPORT

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name _____

Address _____

City, State/Province, Code _____

Phone Number (____) _____

Contact Name _____

Model _____

Serial Number _____

Delivery Date _____

Dealer Name _____

Address _____

City, State/Province, Code _____

Phone Number (___) _____

DEALER INSPECTION REPORT

____ Check Blade Clearance
____ Rotor Turns Freely
____ Fasteners Tight
____ Lubricate Machine
____ Check Cutting Blades and Chop Block
____ Check that Spring-Loaded Clutch Control Moves Freely

SAFETY

____ All Decals Installed
____ Guards and Shields Installed and Secured
____ Review Operating and Safety Instructions

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. Signature _____

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date _____ Owner's Signature _____

To activate warranty, register your product online at www.surgemaster.ca

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Surgemaster Chipper-Shredder when ordering parts or requesting service or other information.

The serial number plate is located where indicated. Please mark the numbers in the spaces provided for easy reference.

SM32S

SERIAL NUMBER LOCATION

Model Number _____

Serial Number _____

1 INTRODUCTION

Congratulations on your choice of a Surgemaster Chipper-Shredder to compliment your operation. This equipment has been designed and manufactured to meet the needs of a discerning timber or landscaping industry.

Safe, efficient and trouble free operation of your Surgemaster Chipper-Shredder requires that you and anyone else who will be using or maintaining the Chipper-Shredder, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained within the Operator's Manual.

This manual covers the Surgemaster Chipper-Shredder model SM32S. Use the Table of Contents or Index as a guide to locate required information.

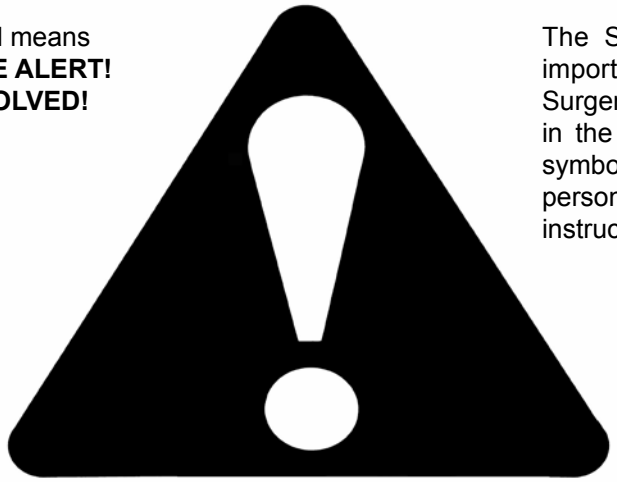
SM32S

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Surgemaster dealer if you need assistance, information or additional copies of the manuals.

2 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means
ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!



The Safety Alert symbol identifies important safety messages on the Surgemaster Chipper-Shredder and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER, WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

DANGER - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please visit the website, **www.surgemaster.ca** or contact EMB, 4144 Boomer Line, St. Clements, ON, N0B 2M0. Phone (519) 699-9283 or Fax (519) 699-4146.

SAFETY

YOU are responsible for the SAFE operation and maintenance of your Surgemaster Chipper-Shredder. **YOU** must ensure that you and anyone else who is going to use, maintain or work around the Chipper-Shredder be familiar with the using and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be used while using the Chipper-Shredder.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** using this equipment is familiar with the recommended using and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Chipper-Shredder owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.

- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Most accidents can be avoided.

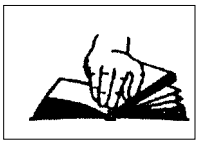
- A person who has not read and understood all using and safety instructions is not qualified to use the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.

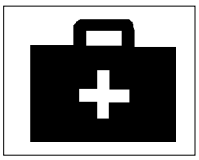
- Think SAFETY! Work SAFELY!

2.1 GENERAL SAFETY

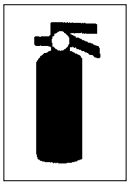
1. Read and understand the Operator's Manual and all safety signs before using, maintaining, adjusting or cleaning the Chipper-Shredder.



2. Have a first-aid kit available for use should the need arise and know how to use it.



3. Have a fire extinguisher available for use should the need arise and know how to use it.



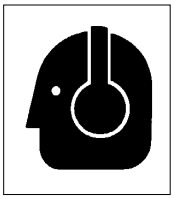
4. Do not allow riders.

5. Wear appropriate protective gear. This list includes but is not limited to:

   - A hard hat
   - Protective shoes with slip resistant soles
   - Protective glasses, goggles or face shield
   - Heavy gloves
   - Wet weather gear
   - Hearing Protection
   - Respirator or filter mask

6. Install and secure all guards before starting.

7. Wear suitable ear protection for prolonged exposure to excessive noise.



8. Turn machine off, stop and disable engine, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

9. Clear the area of people, especially small children, before using the unit.

10. Review safety related items annually with all personnel who will operating or maintaining the Chipper-Shredder.

2.2 EQUIPMENT SAFETY GUIDELINES

1. Safety of the operator and bystanders is one of the main concerns in designing and developing equipment. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you to follow them.

2. In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be used in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.

3. Replace any safety sign or instruction sign that is not readable or is missing. Location of such safety signs is indicated in this manual.

4. Never use alcoholic beverages or drugs which can hinder alertness or coordination while using this equipment. Consult your doctor about using this machine while taking prescription medications.

5. **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to use or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.** Review the safety instructions with all users annually.

6. This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with machinery and trained in this equipment's operations. If the elderly are assisting with work, their physical limitations need to be recognized and accommodated.

7. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - **DON'T TRY IT.**

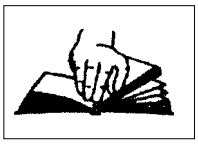
8. Do not modify the equipment in any way. Unauthorized modification may result in serious injury or death and may impair the function and life of the equipment.

9. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the engine and machine manuals. Pay close attention to the Safety Signs affixed to the engine and the machine.

2.3 SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.

2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.

3. 
It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator. It is the operator's responsibility to read and understand ALL Safety and Using instructions in the manual and to follow these. Accidents can be avoided.

4. **Working with unfamiliar equipment can lead to careless injuries. Read this manual before assembly or use, to acquaint yourself with the machine. If this machine is used by any person other than yourself, or is loaned or rented, it is the machine owner's responsibility to make certain that the operator, prior to using:**

   a. Reads and understands the operator's manuals.

   b. Is instructed in safe and proper use.

5. Know your controls and how to stop engine and machine quickly in an emergency. Read this manual and the one provided with engine.

6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will use the machinery. A person who has not read and understood all using and safety instructions is not qualified to use the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with the work, their physical limitations need to be recognized and accommodated.

2.4 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.

2. Replace safety signs that are missing or have become illegible.

3. Replaced parts that displayed a safety sign should also display the current sign.

4. Safety signs displayed in Section 3 each have a part number in the lower right hand corner. Use this part number when ordering replacement parts.

5. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

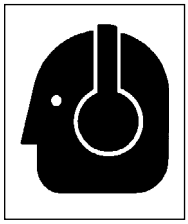
How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

2.5 PREPARATION

1. Never use the machine until you have read and completely understand this manual, the tractor Operator's Manual and each of the Safety Messages found on the safety signs on the engine and machine.

2.
Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, cleaning, or moving the unit. Do not allow long hair, loose fitting clothing or jewellery to be around equipment.

3. 
PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!
Power equipment with or without equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss. **NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.

4. Clear working area of stones, branches or hidden obstacles that might be hooked or snagged, causing injury or damage.

5. Use only in daylight or good artificial light.

6. Be sure machine is properly mounted, adjusted and in good operating condition.

7. Ensure that all safety shielding and safety signs are properly installed and in good condition.

2.6 MAINTENANCE SAFETY

1. Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

2. Follow good shop practices.

   - Keep service area clean and dry.
   - Be sure electrical outlets and tools are properly grounded.
   - Use adequate light for the job at hand.

3. Make sure there is plenty of ventilation. Never operate the engine of the engine in a closed building. The exhaust fumes may cause asphyxiation.

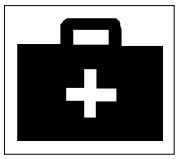
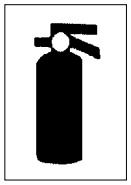
4. Before working on this machine, shut off the engine, set the clutch brake, and turn fuel valve off.

5. Never work on rotor unless it is secured by the clutch brake.

6. Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work. Use heavy or leather gloves when handling blades or knives.

7. Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.

8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.

9. 

Periodically tighten all bolts, nuts and screws and check that all electrical and fuel connections are properly secured to ensure unit is in a safe condition.

10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

2.7 OPERATING SAFETY

1. Please remember it is important that you read and heed the safety signs on the Chipper-Shredder. Clean or replace all safety signs if they cannot be clearly read and understood. They are there for your safety, as well as the safety of others. The safe use of this machine is strictly up to you, the operator.

2. All things with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes potential hazards and follows reasonable safety practices. The manufacturer has designed this Chipper-Shredder to be used with all its safety equipment properly attached, to minimize the chance of accidents. Study this manual to make sure you have all safety equipment attached.

3. Close and secure rotor cover before operating. Install any guards that have been removed.

4. Close and secure all guards, deflectors and shields before starting and operating.

5. Read and understand operator's manual before starting. Review safety instructions annually.

6. Personal protection equipment including hearing protection, hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving. Do not allow long hair, loose-fitting clothing, or jewellery to be around moving parts.

7. Never place any part of your body where it would be in danger if movement should occur during assembly, installation, operation, maintenance, repairing, unplugging or moving.

8. Turn machine off, stop and disable engine, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

9. Do not run machine inside a closed building to prevent asphyxiation from engine exhaust.

10. Use care when feeding material into Chipper-Shredder. Do not send metal, bottles, cans, rocks, glass or other foreign material into Chipper-Shredder. If foreign material enters Chipper-Shredder, stop machine, turn engine off and wait for all moving parts to stop before removing material and/or unplugging. Inspect machine for damaged or loose parts before resuming work.

11. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.

12. Do not allow riders on this machine at any time. There is no safe place for any riders.

13. Never allow children or unauthorized people to operate or be around this machine.

14. Do not reach into shredder or feed hopper openings when the engine is running. Be sure the shredder hopper hinged gate is in good condition and functions as required.

15. Keep the working area clean and free of debris to prevent tripping. Operate only on level ground.

16. Do not point discharge at people, animals or buildings. Rotor can expel wood chips fast enough to cause injury.

17. Do not move or transport Chipper-Shredder when the rotor is turning.

2.8 REFUELLING SAFETY

1. Handle fuel with care. It is highly flammable.

2. Allow engine to cool for 5 minutes before refuelling. Clean up spilled fuel before restarting engine.

3. Do not refuel the machine while smoking or when near open flame or sparks.

4. Fill fuel tank outdoors.

5. Prevent fires by keeping machine clean of accumulated trash, grease and debris.

2.9 STORAGE SAFETY

1. Store the unit in an area away from human activity.

2. Do not children to play on or around the stored machine.

3. Store the unit in a dry, level area. Support the frame with planks if required.

2.10 GAS MOTOR SAFETY

BEFORE STARTING ENGINE, READ AND UNDERSTAND THE OPERATING AND MAINTENANCE INSTRUCTIONS THAT CAME WITH YOUR ENGINE.

WARNING: DO NOT

1. DO NOT run engine in an enclosed area. Exhaust gases contain carbon monoxide, an odourless and deadly poison.

2. DO NOT place hands or feet near moving or rotating parts.

3. DO NOT store, spill, or use gasoline near an open flame, or devices such as a stove, furnace, or water heater which use a pilot light or devices which can create a spark.

4. DO NOT refuel indoors where area is not well ventilated. Outdoor refuelling is preferred.

5. DO NOT refuel while engine is running. Allow engine to cool for 5 minutes before refuelling. Store fuel in approved safety containers.

6. DO NOT remove fuel tank cap while engine is running.

7. DO NOT operate engine if gasoline is spilled. Move machine away from the spill and avoid creating any ignition until gasoline has evaporated.

8. DO NOT smoke while filling fuel tank.

9. DO NOT choke carburettor to stop engine. Whenever possible, gradually reduce engine speed before stopping.

10. DO NOT run engine above rated speeds. This may result in injury.

11. DO NOT tamper with governor springs, governor links or other parts which may increase the governed speed.

12. DO NOT tamper with the engine speed selected by the original equipment manufacturer.

13. DO NOT check for spark with spark plug or spark plug wire removed.

14. DO NOT crank engine with spark plug removed. If engine is flooded, crank until engine starts.

15. DO NOT strike flywheel with a hard object or metal tool as this may cause flywheel to shatter in operation. Use proper tools to service engine.

16. DO NOT operate engine without a muffler. Inspect periodically and replace, if necessary. If engine is equipped with a muffler deflector, inspect periodically and replace, if necessary with correct deflector.

17. DO NOT operate engine with an accumulation of grass, leaves, dirt or other combustible materials in the muffler area.

18. DO NOT use this engine on any forest covered, brush covered, or grass covered unimproved land unless a spark arrester is installed on the muffler. The arrester must be maintained in effective working order by the operator. In the state of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal land.

19. DO NOT touch hot muffler, cylinder or fins because contact may cause burns.

20. DO NOT run engine with air cleaner or air cleaner cover removed.

WARNING: DO

1. ALWAYS DO remove the wire from the spark plug when servicing the engine or equipment to prevent accidental starting. Disconnect the negative wire from the battery terminal if equipped wit a 12 volt starting system.

2. DO keep cylinder fins and governor parts free of grass and other debris which can affect engine speed.

3. DO examine muffler periodically to be sure it is functioning effectively. A worn or leaking muffler should be repaired or replaced as necessary.

4. DO use fresh gasoline. Stale fuel can gum carburettor and cause leakage.

5. DO check fuel lines and fittings frequently for cracks or leaks. Replace if necessary.

2.11 SIGN-OFF FORM

Surgemaster follows the general Safety Standards specified by the International Standards Organization (ISO) and the Occupational Health Administration (OSHA). Anyone who will be using and/or maintaining the Chipper-Shredder must read and clearly understand ALL Safety, Usage and Maintenance information presented in this manual.

Do not use or allow anyone else to use this Chipper-Shredder until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to use this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

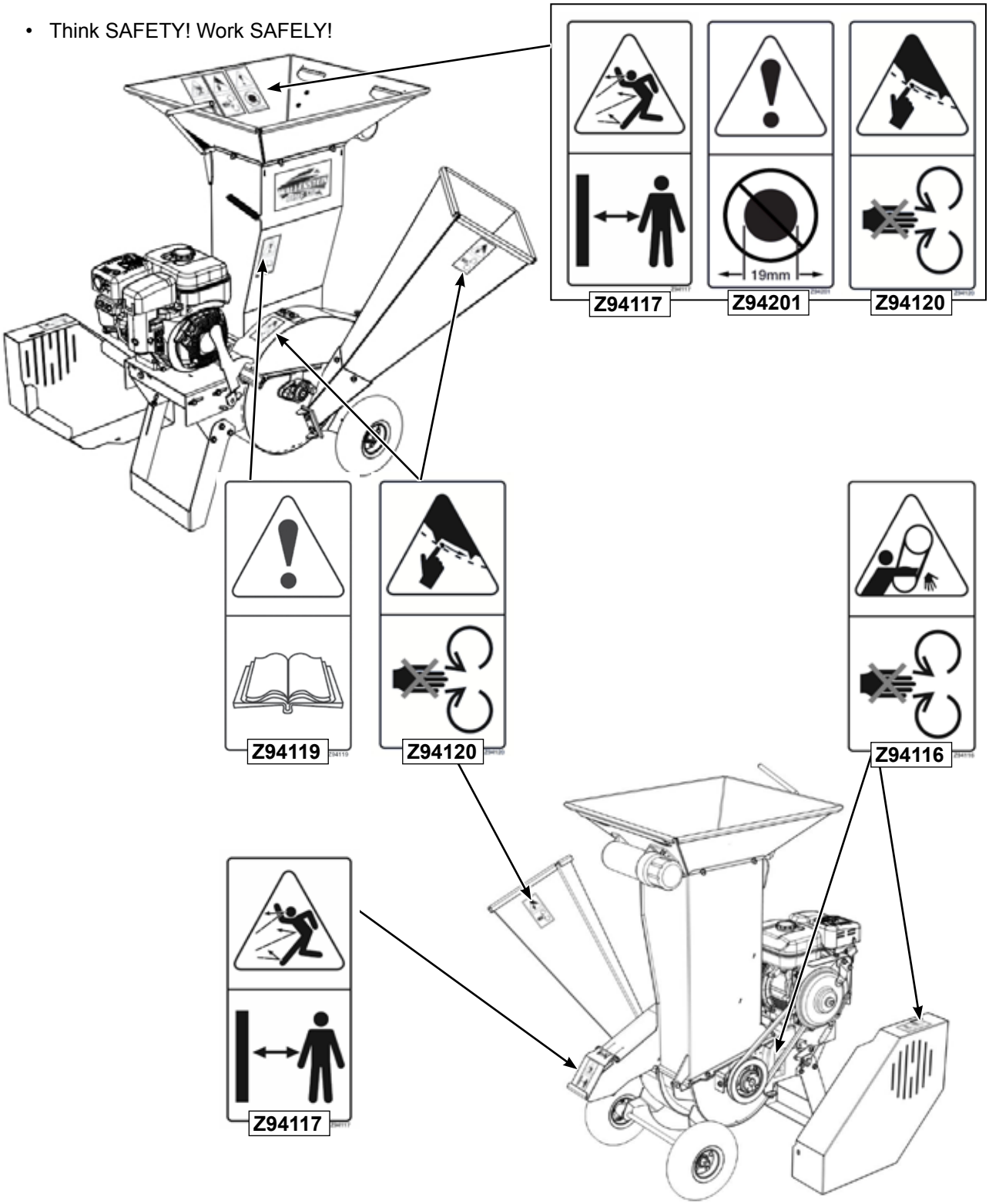
SIGN-OFF FORM

DATE	EMPLOYEES SIGNATURE	EMPLOYERS SIGNATURE

3 SAFETY SIGN LOCATIONS

The types of safety signs and locations on the equipment are shown in the illustrations that follow, and generally apply to both models. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!



REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

4 OPERATION

OPERATING SAFETY

- Close and secure rotor cover before operating.
- Close and secure all guards, deflectors and shields before starting and operating. Install any guards that have been removed.
- Read and understand operator's manual before starting. Review safety instructions annually.
- Personal protection equipment including hearing protection, hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving. Do not allow long hair, loose-fitting clothing, or jewellery to be around moving parts.
- Never place any part of your body where it would be in danger if movement should occur during assembly, installation, operation, maintenance, repairing, unplugging or moving.
- Turn machine off, stop and disable engine, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Do not run machine inside a closed building to prevent asphyxiation from engine exhaust.
- Do not allow riders on this machine at any time. There is no safe place for any riders.
- Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
- Use care when feeding material into Chipper-Shredder. Do not send metal, bottles, cans, rocks, glass or other foreign material into Chipper-Shredder. If foreign material enters Chipper-Shredder, stop machine, turn engine off, and wait for all moving parts to stop before removing material and/or unplugging. Inspect machine for damaged or loose parts before resuming work.
- Never allow children or unauthorized people to operate or be around this machine.
- Do not reach into shredder or feed hopper openings when the engine is running. Be sure the shredder hopper hinged gate is in good condition and functions as required.
- Keep the working area clean and free of debris to prevent tripping. Operate only on level ground.
- Do not point discharge at people, animals or buildings. Rotor can expel wood chips fast enough to cause injury.
- Do not move or transport Chipper-Shredder when the rotor is turning.

4.1 TO THE NEW OPERATOR OR OWNER

The Surgemaster Chipper-Shredders are designed to chip or chop scrap lumber, small trees, brush, limbs and other wood debris. The chipped material is fine enough to be composted or used in a variety of ways.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the work site. Untrained operators are not qualified to use the machine.

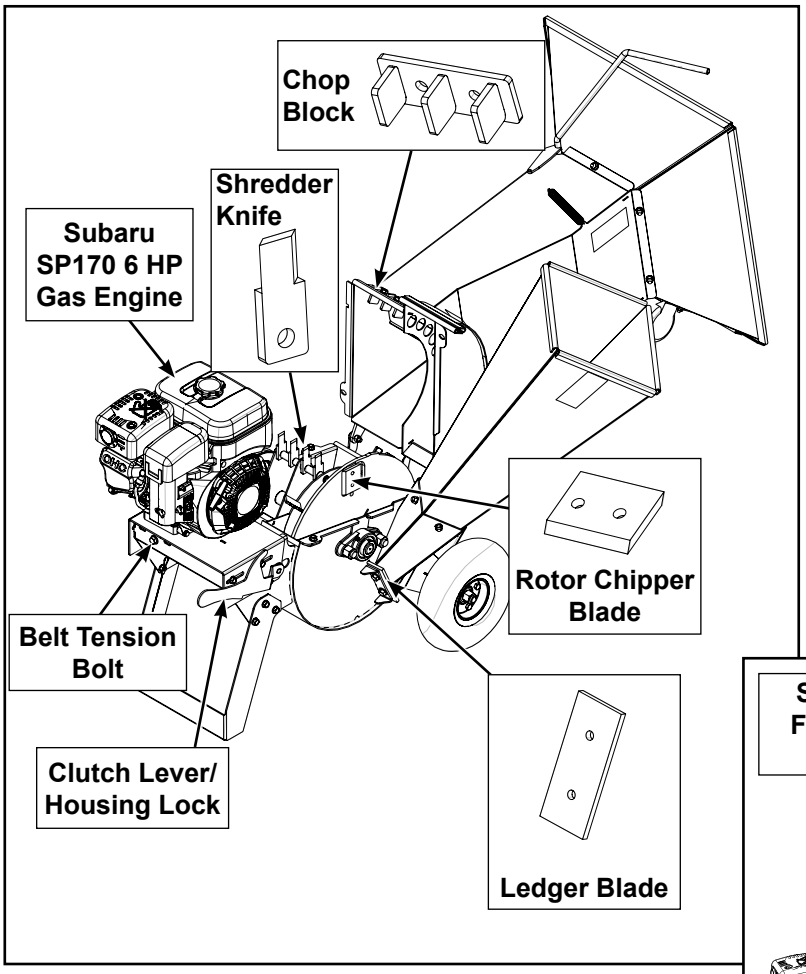
Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to use the Chipper-Shredder safely and how to set it to provide maximum field efficiency. By following the using instructions in conjunction with a good maintenance program, your Chipper-Shredder will provide many years of trouble-free service.

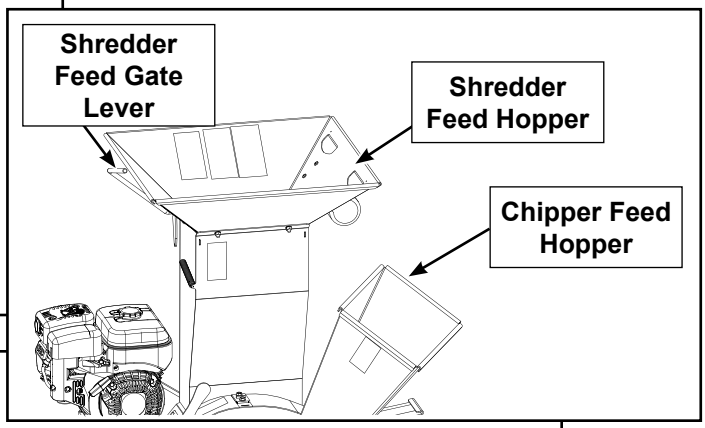
4.2 MACHINE COMPONENTS

The Surgemaster Chipper-Shredder is a rotor with blades and knives for chipping and shredding wood. Feed hoppers move the wood material into the rotor for chipping and into the knives for shredding.

The chipper rotor is designed with 2 blades to provide uniform chip size. The shredder rotor is equipped with 3 sets of swinging knives to provide a fine mulch. A chop-block in the shredder compartment shreds the material as it moves through the machine.

A small gas engine on the frame provides power to the rotor through a V belt drive system. A braking clutch on the engine stops the rotor when the drive is disengaged





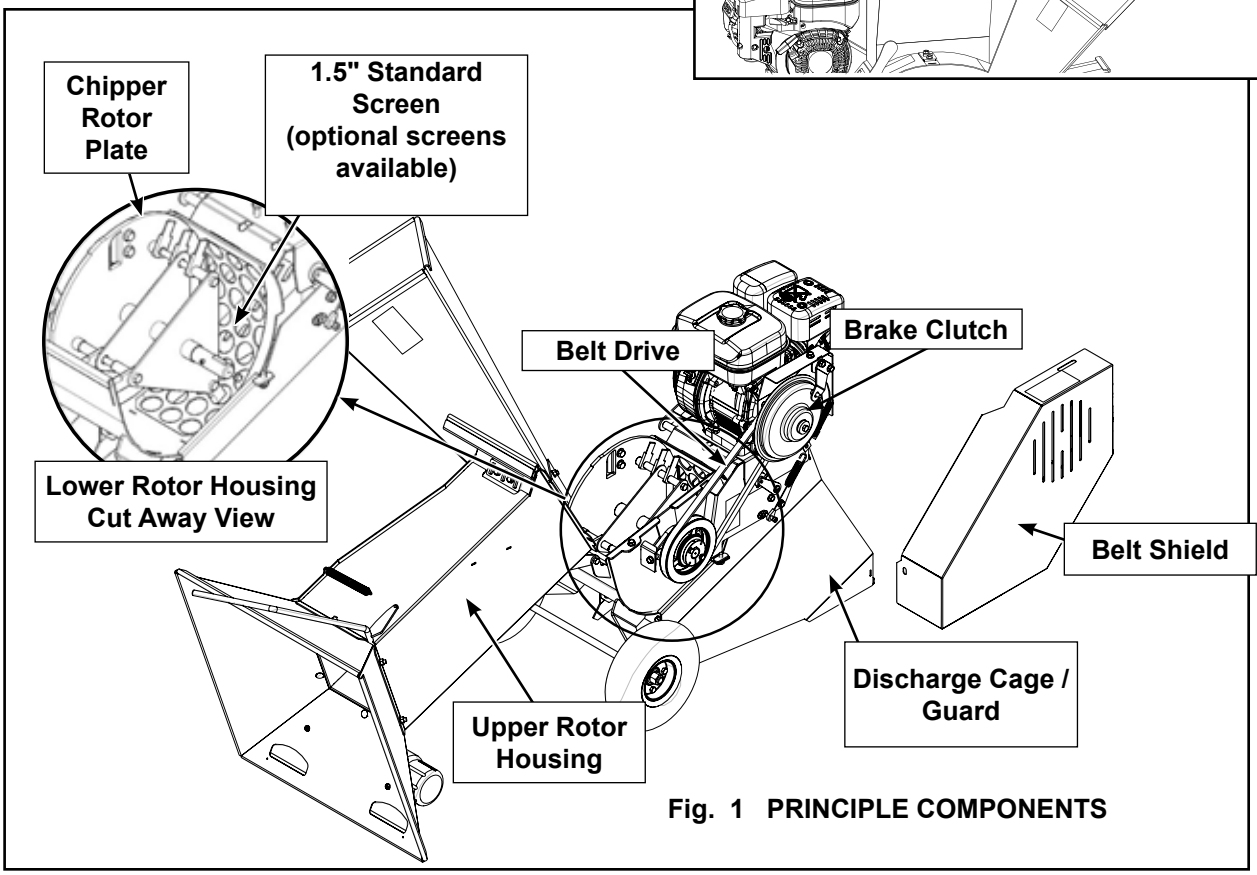


Fig. 1 PRINCIPLE COMPONENTS

4.3 MACHINE BREAK-IN

Although there are no operational restrictions on the Chipper-Shredder when used for the first time, it is recommended that the following mechanical items be checked:

A. **After operating for 1 hour:**

1. Torque all fasteners and hardware.
2. Check condition of rotor bearings.
3. Check the condition and clearance of the knives, chop-block and stationary blades. Adjust or replace as required.
4. Check belt drive system: Tension and pulley alignment.
5. Check the condition of the hopper gate in the shredder feed hopper. The hopper gate must move freely back into position to ensure the safety of the operator by preventing wood from flying out.
6. Check for entangled material. Remove all entangled material before resuming work.
7. Check engine fluid levels. Top up as required.
8. Lubricate all grease fittings.

B. **After operating for 10 hours:**

1. Repeat steps 1 through 8 listed above. (Section A)
2. Change engine oil.
3. Go to the normal servicing and maintenance schedule as defined in the Maintenance Section.

4.4 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Surgemaster Chipper-Shredder requires that each operator reads and understands the using procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining good mechanical condition that this checklist is followed.

Before operating the Chipper-Shredder and each time thereafter, the following areas should be checked off:

1. Lubricate the machine per the schedule outline in the Maintenance Section.
2. Check the rotor, blades and knives. Remove any twine, wire or other material that has become entangled.
3. Check the condition and clearance of the knives, chop block and stationary blades. Adjust or replace as required.
4. Check belt drive system: Tension and alignment.
5. Check the condition of the hopper gate in the shredder feed hopper. The hopper gate must move freely back into position to ensure the safety of the operator by preventing wood from flying out.
6. Check that all bearings turn freely. Replace any that are rough or seized.
7. Check engine fluid levels. Top up as required. Follow safety guidelines for refuelling
8. Make sure that all guards and shields are in place, secured and functioning as designed.

4.5 CONTROLS

Before starting to work, all operators should familiarize themselves with the location and function of controls.

1. **Gas Engine:**
   A 6 hp Subaru engine is used with the unit. Always read the engine manufacturers operator's manual before starting for more detailed instructions.
   a. **Ignition Switch:**
      This switch controls the electrical power to the engine electrical system. Turn the switch clockwise to turn the electrical system ON and the engine will run. Turn the switch counterclockwise to stop the engine.
   b. **Fuel Shut-Off Valve:**
      This valve controls the flow of fuel to the engine. Turn the valve at right angles to the fuel line to turn the fuel off and parallel to turn the fuel on.
   c. **Choke:**
      This push/pull knob controls the position of the choke. Pull the knob out to close the choke for starting when the engine is cold. Push the knob in to open the choke as the engine warms. Always push the knob fully in when operating the machine.
   d. **Throttle:**
      This lever controls the engine RPM. Turn the lever clockwise to increase engine speed and counter-clockwise to decrease.
   e. **Starting Rope:**
      This retracting rope and T bar is used to turn the engine over for starting. Grasp the T bar firmly and pull the rope sharply to start the engine.

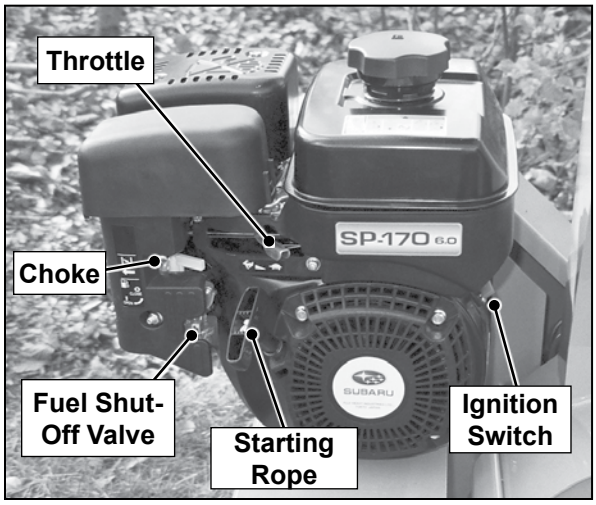


Fig. 2 ENGINE

2. **Shredder Feed Control Lever:**
   The shredder intake is designed with a spring-loaded gate to control the material in the hopper when feeding into the shredder rotor, and to prevent material from flying out while it is being shredded.
   A lever on the engine side of the shredder hopper controls the position of the gate. You can control how much and how fast the material is delivered into the shredder by varying the gate opening.

   a) Move the lever down to open the gate and allow the material to drop into the shredding rotor.

   b) Release the lever and the spring will return the gate into its closed position.

Open

Closed

Fig. 3 SHREDDER FEED CONTROL LEVER

3. Rotor Drive:

The machine is designed with a V belt to transmit power from the engine to the rotor. The clutch is designed with an internal brake that will stop the belt/rotor when engaged.

a. To Start the Rotor: move the lever fully toward the rotor housing to release the clutch brake and drive the rotor. In this position, the handle also prevents opening of the upper rotor housing while the rotor is rotating.

b. To Stop the Rotor: move the lever fully away from the rotor housing to apply the brake in the clutch and stop the rotor.

IMPORTANT

The control lever must be moved fully away from the rotor housing and the clutch brake engaged and engine shut off before the rotor housing can be opened.

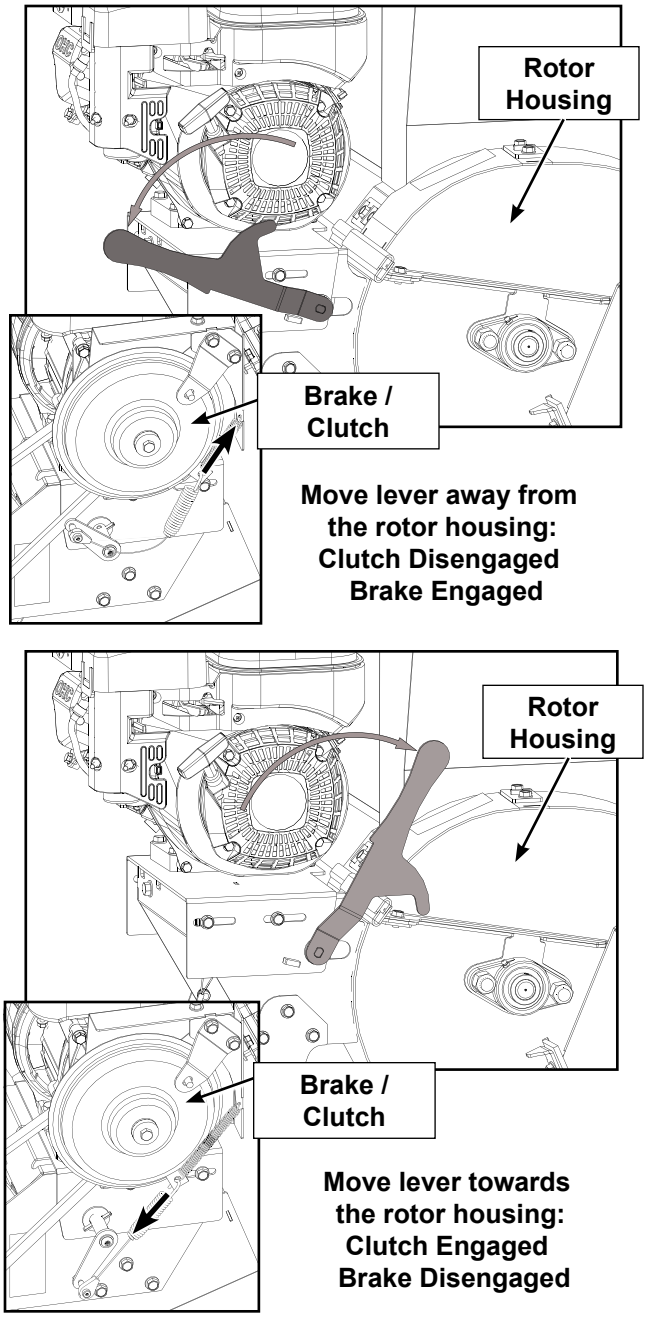


Fig. 4 ROTOR DRIVE

4.6 FIELD OPERATION

OPERATING SAFETY

- Close and secure rotor cover before operating.
- Close and secure all guards, deflectors and shields before starting and operating. Install any guards that have been removed.
- Read and understand operator's manual before starting. Review safety instructions annually.
- Personal protection equipment including hearing protection, hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving. Do not allow long hair, loose-fitting clothing, or jewellery to be around moving parts.
- Never place any part of your body where it would be in danger if movement should occur during assembly, installation, operation, maintenance, repairing, unplugging or moving.
- Turn machine off, stop and disable engine, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Do not run machine inside a closed building to prevent asphyxiation from engine exhaust.
- Do not allow riders on this machine at any time. There is no safe place for any riders.
- Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
- Use care when feeding material into Chipper-Shredder. Do not send metal, bottles, cans, rocks, glass or other foreign material into Chipper-Shredder. If foreign material enters Chipper-Shredder, stop machine, turn engine off, and wait for all moving parts to stop before removing material and/or unplugging. Inspect machine for damaged or loose parts before resuming work.
- Never allow children or unauthorized people to operate or be around this machine.
- Do not reach into shredder or feed hopper openings when the engine is running. Be sure the shredder hopper hinged gate is in good condition and functions as required.
- Keep the working area clean and free of debris to prevent tripping. Operate only on level ground.
- Do not point discharge at people, animals or buildings. Rotor can expel wood chips fast enough to cause injury.
- Do not move or transport Chipper-Shredder when the rotor is turning.

1. Prepare

Although the Chipper-Shredder is easy to use, each operator should review this section to familiarize himself with the detailed safety and operating procedures. Before using this machine, follow these steps:

a. Clear the area of bystanders, especially small children.

b. Review and follow the Pre-Operation Checklist (see Section 4.4).

c. Review operation and function of the controls) see section 4.5)

d. Survey the work site, move to a clear, level work area and position at the work site. Do not start the chipper until it is in position.

e. If possible, sort your materials, the chipper has a **3" (76 mm)** diameter maximum capacity and the shredder has a **3/4" (19 mm)** diameter maximum capacity.

e. Each person must wear appropriate **Personal Protective Equipment (PPE)** whenever operating the Chipper-Shredder or working in the vicinity. This equipment is designed to prevent injury to any personnel in the area. This list includes but is not limited to:

- Safety shoes with slip resistant soles.
- Safety goggles or face shield.
- Hearing protection.
- Heavy or leather gloves.

Fig. 5 PERSONAL PROTECTIVE EQUIPMENT

2. Starting Procedure:

a. Turn the ignition switch clockwise to the "ON" position.

b. Open the fuel valve and move the throttle to its mid idle position.

c. Close the choke if the engine is cold.

d. Using the starting rope, start the engine.

e. Run engine for a few minutes to allow it to warm up.

f. Open the choke.

g. To get the rotor spinning, slowly move the clutch lever towards the rotor housing, to disengage the brake and engage the clutch.

Caution:
Engaging the clutch too quickly may cause the engine to stall.

h. Move the throttle to the high position, to allow the engine to get to full speed.

i. Start feeding material into the hopper for chipping or shredding.

j. Open the shredder hopper gate to move the material into the rotor if shredding.

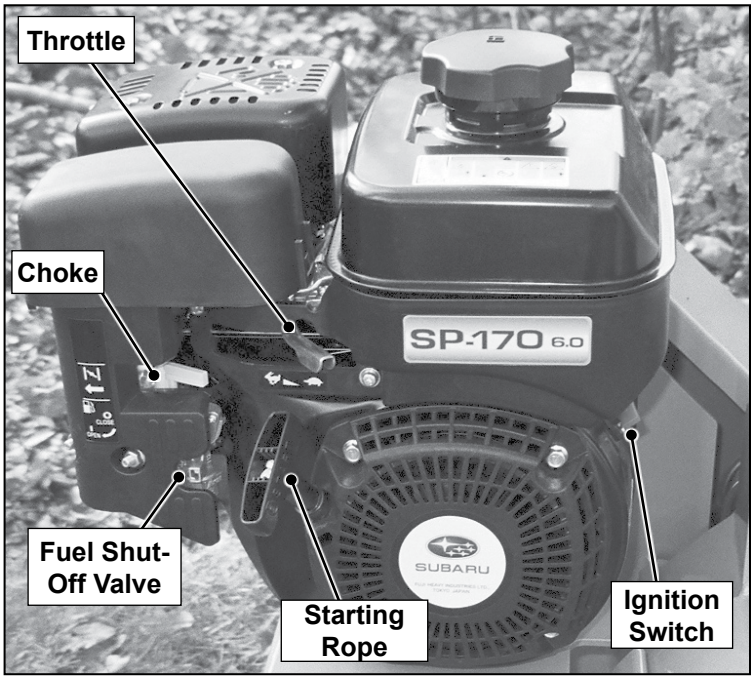


Fig. 6 START THE ENGINE

3. Stopping Procedure:

a. Stop feeding material into the hopper(s).

b. Move the throttle to idle position to slow the engine RPM. Allow 10-15 seconds for the rotor to slow down.

c. Disengage the clutch and engage the clutch brake by moving the lever away from the rotor housing.

d. Turn off the ignition switch, to stop the engine and wait for all moving parts to stop. Shut off the fuel valve.

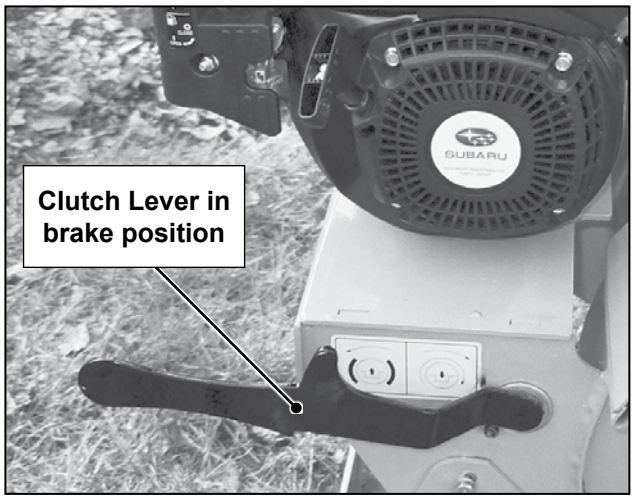


Fig. 7 CONTROL LEVER - BRAKE

4. Emergency Stopping:

If an emergency occurs:

a) shut off the engine, and
b) engage the clutch brake

Correct emergency situation before restarting engine and resuming work.

5. Feeding:

Before beginning work, it may be helpful to sort the material into separate piles for chipping and shredding. The chipper has a **3" (76 mm)** diameter maximum capacity and the shredder has a **3/4" (19 mm)** diameter maximum capacity

a. **Chipper Feed**
When the rotor is up to speed:

- Carefully slide the wooden material into the chipper feed hopper and move it into the rotor. As you begin to feed, the rotor will tend to draw the material through.
- Do not force the material with into the hopper and rotor, slow steady pressure is best.
- If the rotor begins to slow down, stop and let the rotor get back up to speed, then restart feeding.
- Do not reach into the feed hopper further than the hopper opening, to avoid contact the blades on the rotor.
- Use a stick or branch to push any piece of material into the rotor that does not move on its own and stops in the hopper.

**Do not reach into the chipper hopper under any circumstance.
Serious injury may occur.
To safely remove a jam, stop the engine and engage the clutch brake first.**

- Any remaining tree, brush or limb less than 3/4 (19 mm) in diameter or very bushy, can be fed through the shredder.

Caution: Do not place metal, bottles, cans, rocks, or other solid material into the Chipper-Shredder. If something like this gets into the machine, stop the machine immediately for a detailed inspection. Stop engine and wait for all moving parts to stop before inspecting or unplugging. Inspect machine for damaged or loosened parts before resuming work.

b. **Shredder Feed**
When the rotor is up to speed:

- Place the leafy/wooden material into the shredder feed hopper until the hopper is full.
- Use the shredder feed control handle on the side of the hopper to open the feed gate. You can control how much and how fast the material is delivered into the shredder by varying the gate opening.
- If the shredder begins to slow down, stop and let the shredder get back up to speed, then restart feeding.
- Do not reach into the shredder feed hopper further than the gate to avoid contact with the knives on the rotor.

**Do not reach beyond the gate into the shredder housing under any circumstance.
Serious injury may occur.
To safely remove a jam, stop the engine and engage the clutch brake first.**

- Use a stick or branch to push any piece of material into the knives that does not move on its own and stops in the chipper housing.
- Release the handle and the gate will close. Ensure the gate is closed between feeds to keep flying material contained in the shredder housing. **Do not prop open the gate.**

Fig. 8 CHIPPER OPERATION

Fig. 9 SHREDDER OPERATION

6. **Moving:**

The SM32S is designed to be moved easily by tilting the chipper back on its wheels using the hand-holds in the shredder intake chute.
Tilt the unit back, then pull the unit to the desired location. Ensure the engine is off and the clutch lock is engaged before moving.

On the SM32S model, the wood mulch is directed into the discharge cage under the motor, and the unit must be moved periodically to prevent plugging as the chips build up.

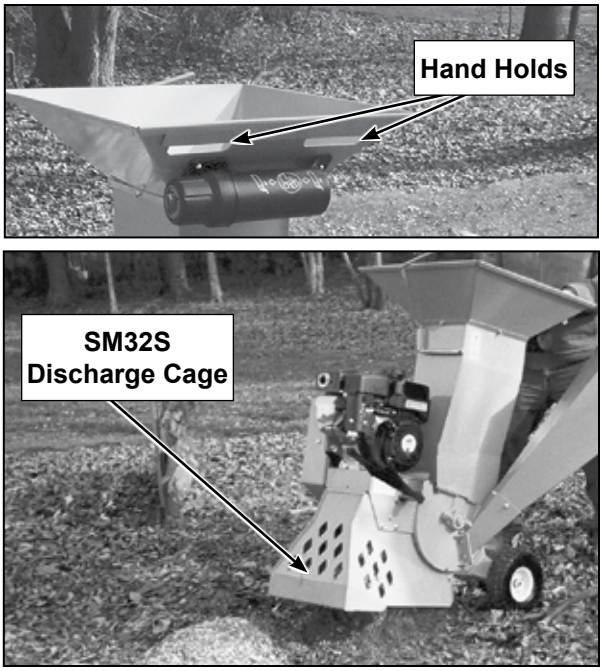


Fig. 10 TILT BACK FOR MOVING

9. Unplugging:

Although the machine is designed to handle a wide variety of material without any problem, occasionally it plugs. When the machine plugs, follow this procedure to clear it:

a. Clear the area of bystanders, especially small children.

b. Follow the stopping procedure and wait for all moving parts to stop before unplugging.

c. Pull the material out of the chipper and shredder feed hoppers. Be sure all the material is out and nothing is jammed or wedged between the input opening and the rotor.

d. Carefully tilt the chipper back and remove all the material from the screen. Remove material from every hole.

f. **Severe plug:**
- Follow the stopping procedure and wait for all moving parts to stop before proceeding.
- Remove the 2 upper rotor housing bolts and carefully open the housing.
- Remove material from inside the rotor compartment.
- Clean out the discharge area/rotor and screen.
- Be sure to turn the rotor by hand to be sure there is nothing jammed between the rotor and stationary blades.
- Close and secure rotor cover. Tighten fasteners to their specified torque.

g. Check that everyone is clear of machine before restarting engine.

h. Start the engine, engage the drive system and resume working.

Fig. 12 UNPLUGING

WARNING

Machine is shown with guard or rotor cover opened for illustrative purposes only. Do not operate machine with guard or cover opened

10. Cleaning:

Clean the machine frequently to prevent a build-up of dust, chips and trash on the frame. A clean machine reduces the chance of fire or rusting.

4.7 STORAGE

OPERATING SAFETY

- Store the unit in an area away from human activity.
- Do not permit children to play on or around the stored machine.
- Store the unit in a dry, level area. Support the frame with planks if required.

4.7.1 PLACING IN STORAGE

After the season's use or when the machine will not be used for a period of time, completely inspect all major systems of the Chipper-Shredder. Replace or repair any worn or damaged components to prevent any unnecessary down time at the beginning of the next season.

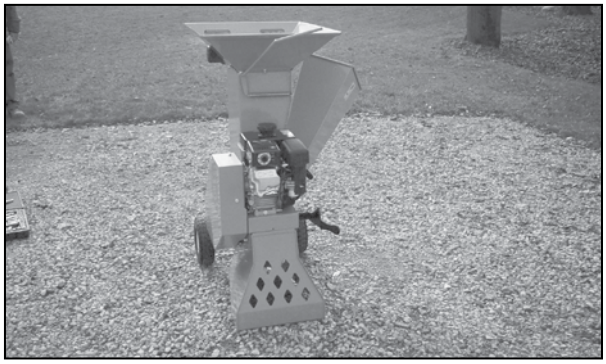
Follow this procedure before storing:

1. Remove all material from the machine.
2. Wash and store in a dry, secure location.
3. Thoroughly wash the machine with a pressure washer or water hose to remove all dirt, mud or debris.
4. Lubricate all grease points to remove any water residue from washing.
5. Inspect all rotating parts for entangled material. Remove all entangled material.
6. Run the machine a few minutes to dry the moisture from inside the machine.
7. Discharge fuel to prevent gum in the fuel system and carburetor parts. Review the engine owners manual for the proper proceedure.
8. Touch up all paint nicks and scratches to prevent rusting.
9. It is best to store the machine inside. If that is not possible, cover with a waterproof tarpaulin and tie down securely.
10. Store in an area away from human activity.
11. Do not allow children to play around the stored unit.

4.7.2 REMOVING FROM STORAGE

When removing this machine from storage, follow this procedure:

1. Remove the tarpaulin if covered.
2. Review and follow the pre-operation checklist.



SM32S

Fig. 13 STORED

5 SERVICE AND MAINTENANCE

MAINTENANCE SAFETY

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
- Follow good shop practices.
  - Keep service area clean and dry.
  - Be sure electrical outlets and tools are properly grounded.
  - Use adequate light for the job at hand.
- Make sure there is plenty of ventilation. Never operate the engine in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on this machine, shut off the engine, move clutch lever to engage the clutch brake, and wait for all moving parts to stop. Ensure the ignition switch is set to off and close the fuel shut off valve.
- Never work under equipment unless it is blocked securely.
- Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance work. Use heavy gloves when handling sharp components.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
- A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.
- Periodically tighten all bolts, nuts and screws and check that all electrical and fuel connections are properly secured to ensure unit is in a safe condition.
- When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

WARNING

Machine is shown with guard removed for illustrative purposes only. Do not operate machine with guard removed.

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. **Engine Oil:**

   Refer to the engine manufacturer's manual for maintenance and service information

2. **Grease:**

   Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium base grease.

3. **Engine Gasoline:**

   Use a standard automotive unleaded gasoline for all operating conditions.

   Fuel tank capacity:
   (3.6 L) 3.8 US Qt

4. **Storing Lubricants:**

   Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

5.1.2 GREASING

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passage. Replace fitting if necessary.
5. Rotor bearings are sealed bearings, over greasing will damage the seal, **only grease as specified**: 1 shot of grease every 100 hrs of use.

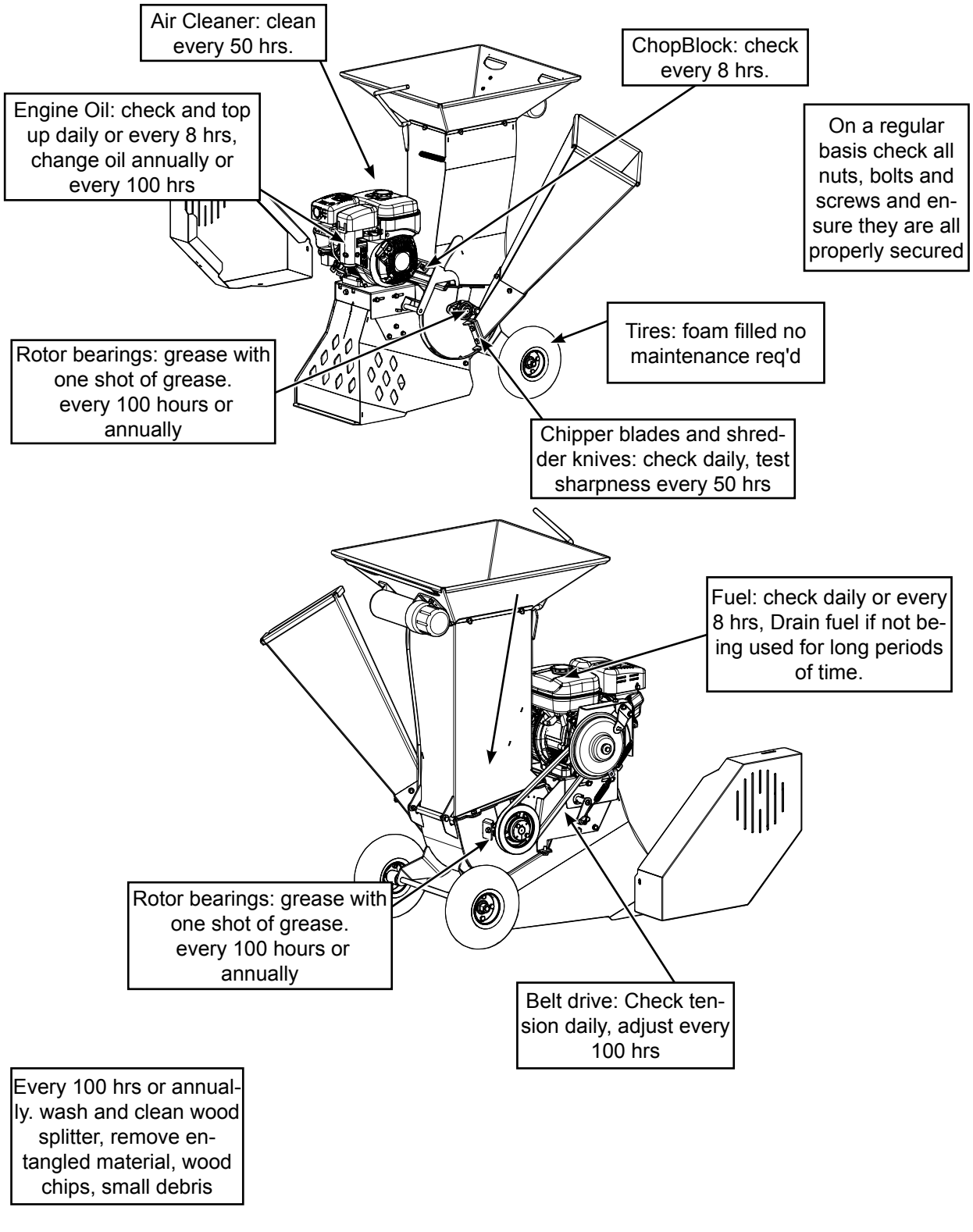
IMPORTANT
Do not over grease.

5.1.3 SERVICE ILLUSTRATION

See Service Record Chart

This illustration shows the general location of service points for all models in this manual.

Refer to your engine instruction manual for specific maintenance instructions / requirements


Air Cleaner: clean every 50 hrs.
ChopBlock: check every 8 hrs.
Engine Oil: check and top up daily or every 8 hrs, change oil annually or every 100 hrs
On a regular basis check all nuts, bolts and screws and ensure they are all properly secured
Tires: foam filled no maintenance req'd
Rotor bearings: grease with one shot of grease. every 100 hours or annually
Chipper blades and shredder knives: check daily, test sharpness every 50 hrs
Fuel: check daily or every 8 hrs, Drain fuel if not being used for long periods of time.
Rotor bearings: grease with one shot of grease. every 100 hours or annually
Belt drive: Check tension daily, adjust every 100 hrs
Every 100 hrs or annually. wash and clean wood splitter, remove entangled material, wood chips, small debris

5.1.4 SERVICE RECORD CHART

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.
Refer to your engine instruction manual for specific maintenance instructions / requirements

8 Hours or Daily						50 Hours or Annually			100 Hours or Annually			
	Check	Check	Check	Check	Check	Clean	Change	Sharpen	Grease	Change	Adjust	Clean
Twig Breaker, Chop Block, Blades, Knives	Secure fasteners	Engine Oil Level	Fuel Level	Belt Drive /Pulley Alignment	Air Cleaner	Engine Oil	Chipper Blades, Shredder Knives	Rotor Bearings	Engine Oil	Belt Drive	Clean Machine	Servicer Hrs

5.2 MAINTENANCE

5.2.1 BELT TENSION / ROTOR BRAKE:

The machine is designed with a clutch on the engine shaft equipped with an internal brake that when engaged is used to brake the engine pulley and prevent it from turning.

This in turn will stop the belt dive and rotor plate pulley. When the belt is in disrepair or loose, the ability to stop the rotor quickly may be affected.
Therefore it is important to periodically check the condition as well as the tension of the belt.
Frayed, cracked or worn drive belts should be replaced. Drive belt should deflect no more than 1/4 to 3/8" (6 mm to 10 mm).

Drive Belt Tension Check and Adjustment:

1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Remove the 4 bolts that hold the belt shield to the chipper, remove the belt shield.
3. Check the tension by pushing on the belt with your fore finger and measure its defection. Drive belt should deflect no more than 1/4 to 3/8" (6 mm to 10 mm).
4. If the belt requires adjustment, loosen (do not remove) the 4 x bolts that hold the engine mount to the main frame, (2 on each side of the motor mount).
5. Turn the belt tensioning bolt clockwise, to pull the engine mount outwards to tighten the belt or turn the bolt clockwise, to loosen the belt.
6. Snug 1 bolt on each side of the engine mount.
7. Check the tension by pushing on the belt with your fore finger and measure its defection. Drive belt should deflect no more than 1/4 to 3/8" (6 mm to 10 mm).
8. If the tension is incorrect, loosen the engine mount bolts and adjust the belt tension bolt as required.
9. When tension is correct, tighten up all four engine mount bolts and replace the belt shield and bolts.

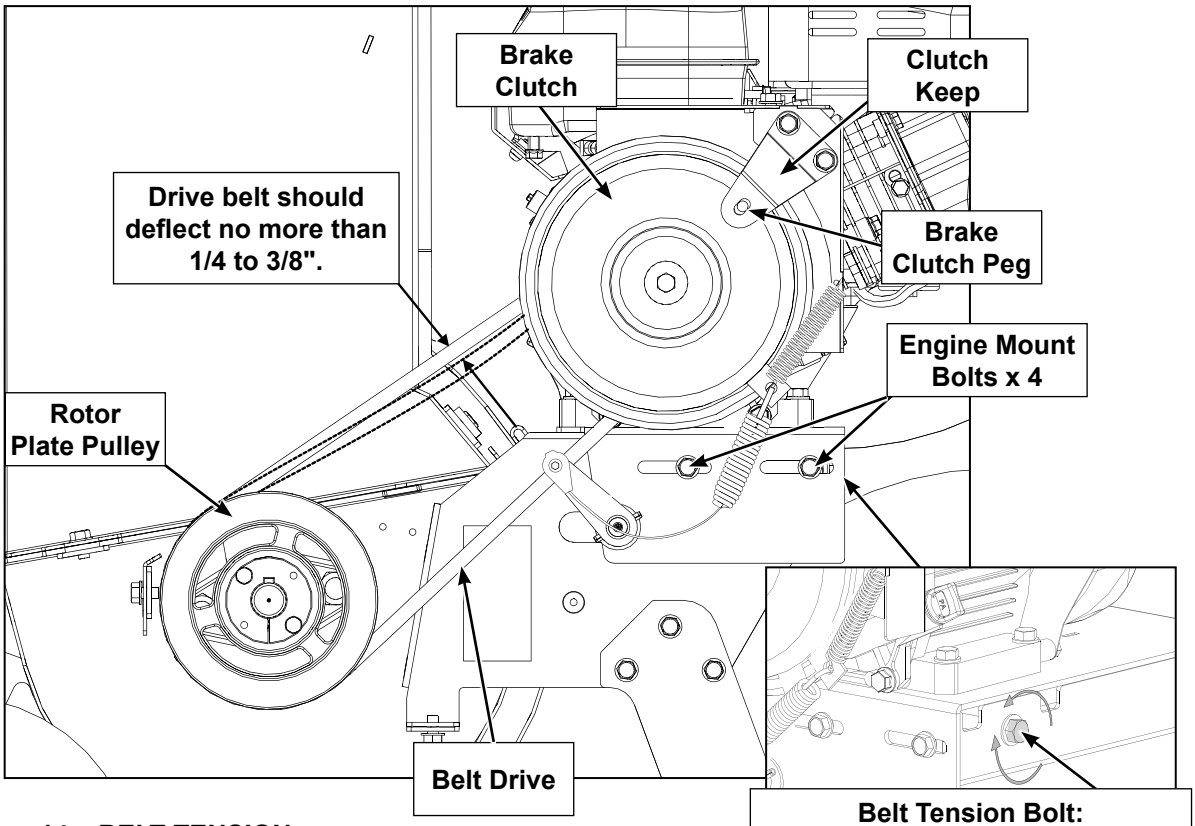

Brake Clutch
Clutch Keep
Drive belt should deflect no more than 1/4 to 3/8".
Brake Clutch Peg
Engine Mount Bolts x 4
Rotor Plate Pulley
Belt Drive
Belt Tension Bolt:
1. To tighten turn clockwise
2. To loosen turn counter-clockwise.

Fig. 14 BELT TENSION

Drive Belt Replacement:

1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Remove the 4 bolts that hold the belt shield to the chipper
3. Remove the 2 bolts the hold the clutch keep to the shield mount, and remove the clutch keep
4. Loosen (do not remove) the 4 x bolts that hold the engine mount to the main frame (two on each side of the motor mount)
5. Turn the belt tensioning bolt counter clockwise, until belt is loose enough to remove, then remove the belt
6. Replace with the new belt
7. Replace the clutch keep and its bolts (ensure the peg on the brake clutch is in the slot in the clutch keep
8. Turn the belt tensioning bolt clockwise, to pull the engine mount outwards to tighten the belt
9. Check the tension by pushing on the belt with your fore finger and measure its defection. Drive belt should deflect no more than 1/4 to 3/8" (6 mm to 10 mm).
10. If the tension is incorrect, loosen the engine mount bolts and adjust the belt tension bolt as required.
11. When tension is correct, check pulley alignment then tighten up all four engine mount bolts, and replace the belt shield and bolts.
12. Recheck tension after 10 hrs of use.

5.2.2 MULCHING SCREEN:

The SM32S model is designed with a screen in the bottom of the rotor frame. The screen retains the wood material in the rotor chamber until it is small enough to exit through the holes and drop to the ground under the rotor.
The standard screen features 1-1/2" (38 mm) diameter round screen, for general purpose mulching. Two optional screens are available: 3/4" (19 mm) diameter round for a finer mulch and 1-1/2" x 7.0" (38 mm x 178 mm) oblong hole for wet material. See Accessories section for ordering information.

To remove the mulching screen:

1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Carefully tilt the machine back, so the hoppers are resting on the ground and the bottom of the machine is exposed
3. Remove the two mounting nuts and bolts that hold the screen into the bottom housing.
4. Remove the screen.
5. Reverse steps to re-install the screen.

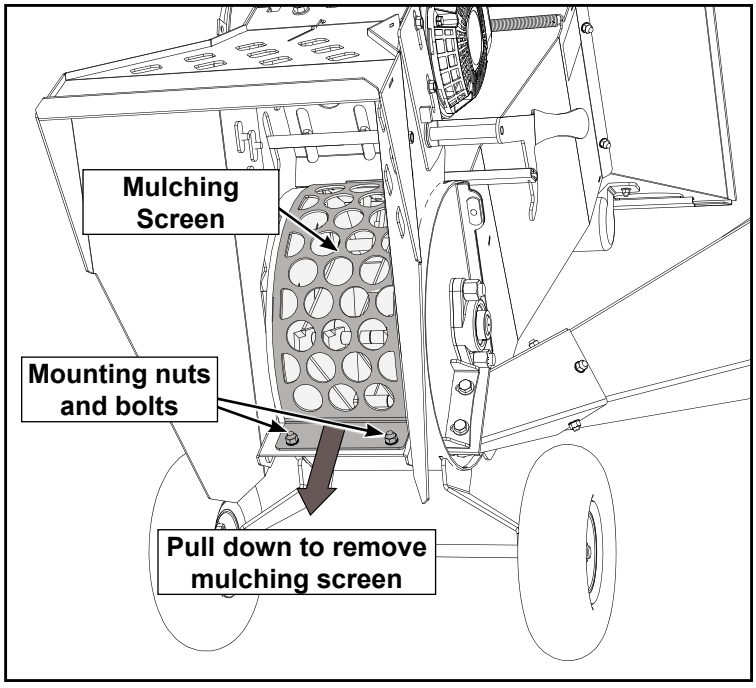


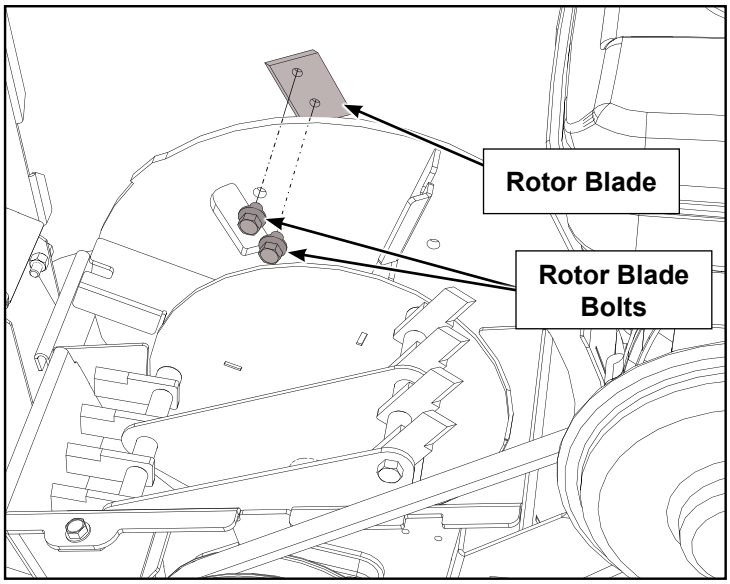
Fig. 15 MULCH SCREEN

5.2.3. BLADE, KNIFE AND BREAKER MAINTENANCE:

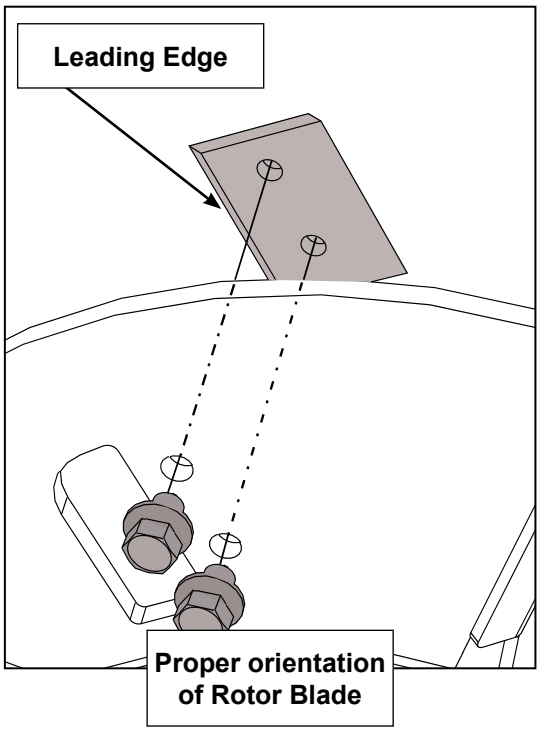
The shredder knives, rotor and ledger blades need to be sharp for the Chipper-Shredder to perform as expected. Periodic inspection is recommended. Keep the knives sharp to reduce the amount of power required during operation. Watch the sharpness of the knives when processing material with a lot of sand, soil or dirt mixed with it. Reverse or sharpen the knives if the cutting edge becomes dull.

Rotor Blades:

The rotor is equipped with 2 blades placed at 180° to each other to keep the rotor in balance. If one needs to be changed, the one opposite should be changed.
It is recommended that the rotor blades be removed from the rotor when sharpening. Always sharpen the blades at a 45° angle to provide the best cutting effect as it meets the stationary blade. Be sure to tighten the blade mounting bolts to their specified torque when re-installing the blades to the rotor.



1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Remove the 2 bolts that hold the upper rotor housing, and carefully open the rotor housing.
3. Manually rotate chipper rotor plate so that the blade is fully exposed
4. Remove the 2 bolts that hold the rotor blade to the rotor, remove the blade.
5. Rotate the blade and reinstall or replace with new or re-sharpened blade.
6. Ensure the blade is properly oriented, with the leading edge out. The blade is designed to fit into the rotor one way only. See diagram for proper installation.
7. Tighten down bolts as specified in the torque chart
8. Repeat steps for second blade.



WARNING

Machine is shown with guard removed for illustrative purposes only. Do not operate machine with guard removed.

Fig. 16 ROTOR BLADE

Shredder Knives:

The shredder rotor is designed with 3 sets of swinging knives (8 knives on the **SM32S)**. Each knife has a bevelled edge that cuts, chops and mulches the material as it moves around the rotor compartment. In addition the chop block helps to break the material into smaller pieces and turn it into mulch. The material stays in the rotor housing until it is fine enough to escape through the holes in the screen at the bottom of the rotor frame.

1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Remove the 2 bolts that hold the upper rotor housing, and carefully open the rotor housing.
3. Manually rotate chipper rotor plate so that one set of shredder knives is fully exposed
4. Loosen the shredder bolt that holds the set of shredder knives and spacers to the shredder plate,
5. Slowly remove the bolt while catching the knives and spacers as they become free.
6. Reverse the knife and replace, or replace with new or re-sharpened knives.
7. **Ensure that the knives and spacers are installed in the correct sequence, improper installation will decrease performance of the shredder. Refer to diagram for help.**
8. Tighten down bolts as specified in the torque chart, ensure knives rotate freely.
9. Repeat steps for second and third sets of shredder knives.

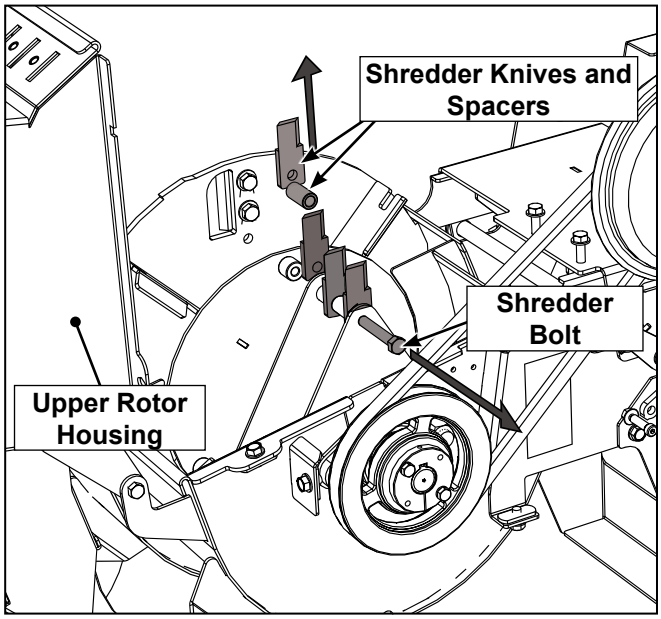
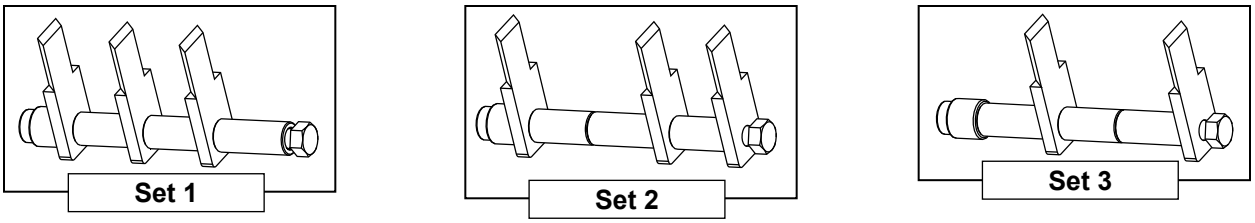


Fig. 17 SHREDDER KNIVES



SM32S knife / spacer sequence

Fig. 17 SHREDDER KNIFE SEQUENCE

Ledger Blades:

Each machine is equipped with a ledger (stationary) blade that acts as a shear for the moving rotor blades.

The ledger blade is designed with 4 usable corners. When the corner facing the rotor blade rounds over, remove the blade and re-install with a different corner facing the rotor blade. It is recommended that the clearance between the rotor and stationary blades be set and maintained at 1/32 to 1/16 " (.76 - 1.52 mm) to obtain the best performance.

1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Remove the 2 bolts that hold the ledger blade to the ledger mount, remove the blade.
3. Rotate the blade and replace or replace with new or re-sharpened blade.
4. Hand tighten the bolts and set the clearance between the ledger and rotor blades at 1/32 - 1/16" (.76 - 1.52 mm). For fast and easy setting, use our chipper clearance setting tool, available from your dealer (see accessories)
5. Tighten down bolts as specified in the torque chart

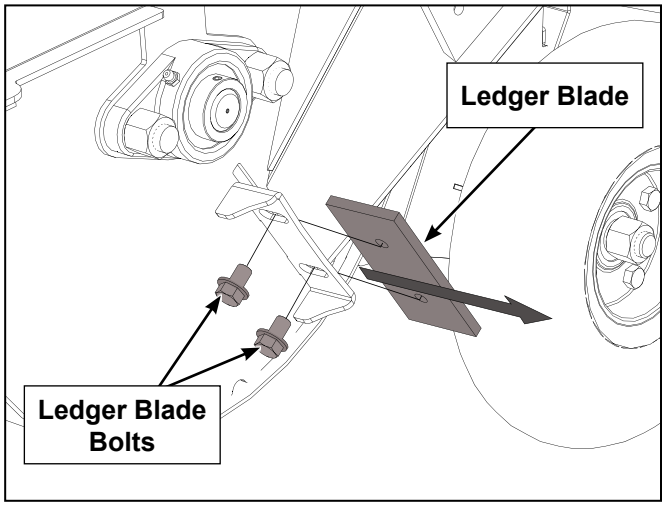


Fig. 18 LEDGER BLADE

ChopBlock:

The ChopBlock is an assembly of breaker tabs bolted in at the bottom of the upper rotor housing. The shredder knives pass through the chop block, and helps to break the material into smaller pieces and turn it into mulch. Inspect the chop block for damage such as gouges, bent, or missing teeth. A damaged chop block should be replaced. If it teeth are showing wear, remove and rotate the chop block.

1. Ensure the engine is off (ignition switch is off and the fuel valve is closed).
2. Remove the 2 bolts that hold the upper rotor housing, and carefully open the rotor housing.
3. Remove the 2 bolts that hold the chop block to the housing, remove the chop block.
4. Reverse the steps to install the new chop block.

WARNING

Machine is shown with guard removed for illustrative purposes only. Do not operate machine with guard removed.

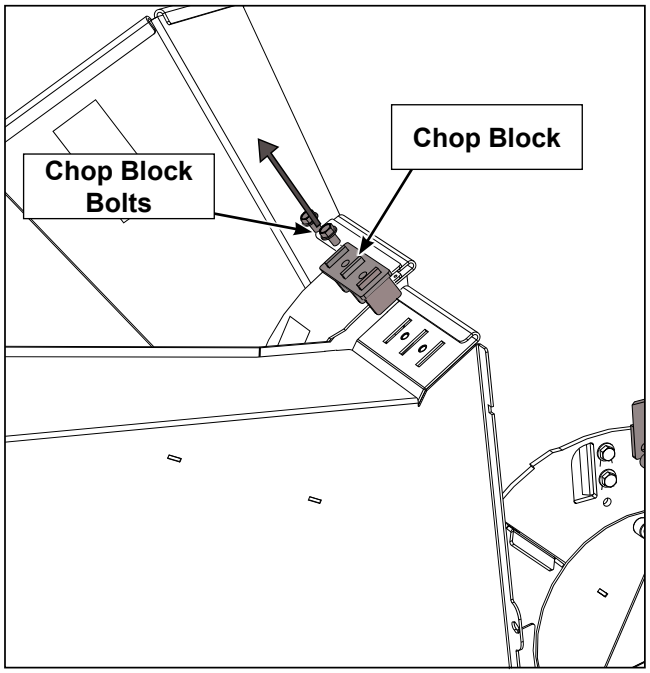


Fig. 19 CHOPBLOCK

6 TROUBLE SHOOTING

The Surgemaster Chipper-Shredder is designed with blades and knives on a rotor to cut, shear and chip wooden material into chips or mulch. It is a simple and reliable system that requires minimal maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local distributor or dealer. Before you call, please have this Operator's Manual from your unit and serial number ready.

6.1 TROUBLE SHOOTING CHART

Always wear the appropriate safety gear when trouble shooting, performing maintenance or working around the machine. This includes but is not limited to:

- Hard hat for protection to the head.
- Face mask for protection to the face and eyes.
- Heavy gloves for hand protection.
- Safety shoes with slip resistant soles and steel toes

PROBLEM	CAUSE	SOLUTION	CAUTION	
Rotor does not turn	Obstructed discharge.	Clear debris or material screen.		Ensure machine is off
	Rotor plugged.	Inspect and clear chipper hopper lower rotor housing and rotor.		Ensure machine is off
	Loose belt.	Follow tension adjustment procedure and tighten belt.		Ensure machine is off
	Brake Clutch spring broken.	Remove belt shield and inspect clutch spring.		Ensure machine is off, call technician for repair
	Broken belt.	Follow belt replacement procedure and replace belt.		Ensure machine is off
Slow feeding.	Low engine speed.	Check that choke is off, and throttle is set to maximum.		
	Blades and/or knives are dull.	Rotate, sharpen or replace blade and/or knives.		Ensure machine is off
	Rotor blade angle wrong, improper angle.	Re-sharpen knives to specified angle and check that blade is installed properly.		Ensure machine is off
	Collector bag full.	Detach and empty bag.		Ensure machine is off
	Obstructed discharge.	Clear debris from discharge chute (BXMC32B) or material screen (BXMC32S).		Ensure machine is off
	Screen plugged discharge cage is full	Move chipper to new location and clear screen (BXMC32S).		Ensure machine is off

PROBLEM	CAUSE	SOLUTION	CAUTION	
Unusual vibration while running.	Broken or missing blade or knife.	Replace broken/missing blade or knife.		Ensure machine is off.
	Rotor may be bent	Check rotor to see if it wobbles. Replace rotor		Ensure machine is off, call technician for repair
Mulch too Course	ChopBlock or Twig Breaker may be damaged	Inspect ChopBlock and Twig Breaker, replace if damaged.		Ensure machine is off.
	Broken or missing blade or knife.	Replace broken/missing blade or knife.		Ensure machine is off.
	Knives in shredder improperly re-installed	Check installation of knives and adjust as required, per maintenance instructions.		Ensure machine is off.
	Improper mulch screen installed	Replace with proper sized screen for material (see accessories)		Ensure machine is off.
Mulch too Fine	Improper mulch screen installed	Replace with proper sized screen for material (see accessories)		Ensure machine is off.
Machine requires excessive power or stalls.	Obstructed discharge.	Clear debris or material screen.		Ensure machine is off
	Engaging clutch too quickly	Engage clutch slowly, ensure hoppers and rotor housing are empty.		
	Collector bag full.	Detach and empty bag.		Ensure machine is off
	Feeding in too much material	Feed smaller amounts into shredder hopper.		
	Feeding material too quickly	Feed larger material slowly into chipper hopper.		
	Rotor plugged.	Inspect and clear chipper hopper lower rotor housing and rotor.		Ensure machine is off
	Green material will not discharge.	Allow material to dry or alternate dry/wet material.		
		Use wet material screen (see accessories - BXMC32S)		Ensure machine is off.
	Chipper blade clearance too large.	Set clearance to 1/32 to 1/16 " (.76 - 1.52 mm). Use chipper clearance tool (see accessories)		Ensure machine is off.
	Dull blades and/or knives.	Rotate, sharpen or replace blade and/or knives		Ensure machine is off.
Engine related issues.	*Refer to your engine instruction manual for specific trouble shooting instructions / requirements.*			

7 SPECIFICATIONS

7.1 MECHANICAL

MODEL	**BXMC32S**
ENGINE	SUBARU SP170 6 HP (4.5 kW) - GAS
ENGINE RPM - CONTINUOUS	3600 RPM
DRIVE SYSTEM	BRAKE-CLUTCH WITH BELT DRIVE
NUMBER OF ROTOR BLADES	2 OFFSET
BLADE TYPE	HARDENED TOOL STEEL
NUMBER OF SHREDDER KNIVES	8 (2 SETS OF 3, 1 set of 2)
SHREDDER KNIFE TYPE	HARDENED STEEL
ROTOR SPECIFICATIONS	28 LBS. (12.7 KG) 14" (356 MM)
FEEDING SYSTEM	MANUAL HOPPER CHIPPER & SHREDDER
SHREDDER CAPACITY	3.5" X 5" OPENING W/ 3.0" MAX DIAMETER MATERIAL (89 MM X 127 MM OPENING W/ 19 MM MAX DIAMETER MATERIAL)
CHIPPER CAPACITY	6" X 7" OPENING W/ 3.0" MAX DIAMETER MATERIAL (152 MM X 179 MM OPENING W/ 76 MM MAX DIAMETER MATERIAL)
DISCHARGE	BOTTOM DISCHARGE W/1.5" (38 MM) SCREEN
MACHINE TYPE	CONSUMER YARD EQUIPMENT
TIRES:	4.10 X 3.5 FOAM FILLED RUBBER
DIMENSIONS W x L X H	38" x 43" x 47"
WEIGHT	250 LBS
SCREENS	2 OPTIONS
GARDEN TRAILER HITCH	OPTIONAL

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

7.2 BOLT TORQUE

CHECKING BOLT TORQUE

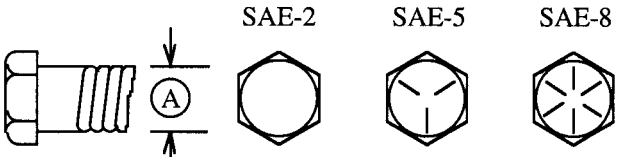
The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

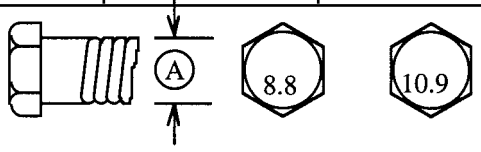
ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque*					
	SAE 2		SAE 5		SAE 8	
	(N.m)	(lb-ft)	(N.m)	(lb-ft)	(N.m)	(lb-ft)
1/4"	8	6	12	9	17	12
5/16"	13	10	25	19	36	27
3/8"	27	20	45	33	63	45
7/16"	41	30	72	53	100	75
1/2"	61	45	110	80	155	115
9/16"	95	60	155	115	220	165
5/8"	128	95	215	160	305	220
3/4"	225	165	390	290	540	400
7/8"	230	170	570	420	880	650
1"	345	225	850	630	1320	970



METRIC TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque*			
	8.8		10.9	
	(N.m)	(lb-ft)	(N.m)	(lb-ft)
M3	.5	.4	1.8	1.3
M4	3	2.2	4.5	3.3
M5	6	4	9	7
M6	10	7	15	11
M8	25	18	35	26
M10	50	37	70	52
M12	90	66	125	92
M14	140	103	200	148
M16	225	166	310	229
M20	435	321	610	450
M24	750	553	1050	774
M30	1495	1103	2100	1550
M36	2600	1917	3675	2710



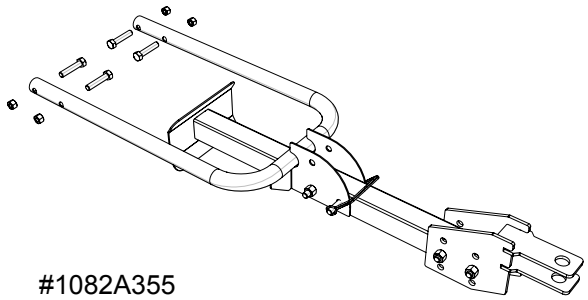
8 ACCESSORIES

Call your dealer for pricing and availability
For replacement parts, go to **www.embmfg.com** and click on "Parts and Manuals" to download the latest parts manual for you model splitter, then call your dealer to order.

#1012L269

#1012L269 LEDGER CLEARANCE SETTING GAUGE

For models: **SM32S**
An easy and accurate way of setting the critical clearances between the ledger blade and the rotor chipper blade.

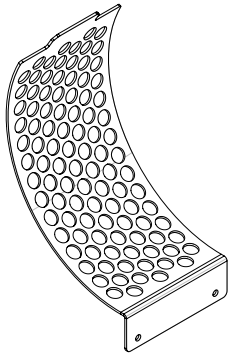


#1082A355

#1082A355 GARDEN TRACTOR HITCH

For model: **SM32S**
Allows for hauling your chipper / shredder with your garden tractor, great for those big properties.

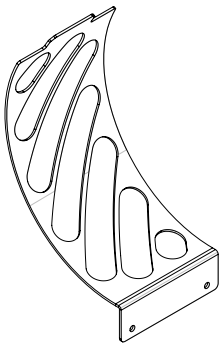
Easy to install, bolt on to your chipper / shredder and you're ready to go!



#1074L240

#1074L240 3/4" ROUND SCREEN (19MM)

For models: **SM32S**
Conversion kit, simple to install. Makes a finer mulch than the standard screen.



#1074L260

#1074L260 1 1/2" X 7.0 OBROUND WET SCREEN

For models: **SM32S**
Bolt on, easy to install conversion kit. Works well to prevent clogs when working with wet material.

INDEX

A

ACCESSORIES **39**

B

BELT TENSION **30**
BREAK-IN **18**

C

CHIPPER FEED **23**
CHOKE **19**
CHOPBLOCK **34**
CLEANING **25**
COLLECTOR BAG **24**
COMPONENTS **17**

D

DRIVE BELT REPLACEMENT **31**

E

EMERGENCY STOPPING **22**
ENGINE **19**
ENGINE OIL **27**

F

FEED CONTROL LEVER **19**
FIELD OPERATION **21**
- FEEDING 23
- NO BAG 24
- PREPARE 21
- STARTING 22
- STOPPING 22

FUEL SHUT-OFF **19**

G

GREASING **27**

I

IGNITION **19**
ILLUSTRATION **28**
INSPECTION **4**

L

LEDGER BLADES **33**

M

MOVING **24**
MULCHING SCREEN **31**

N

NEW OPERATOR **16**

R

ROTOR BLADES **32**
ROTOR DRIVE **20**

S

SAFETY **7, 12**
- EQUIPMENT 9
- GENERAL 8
- MAINTENANCE 11
- MOTOR 13
- OPERATING 12
- PREPARATION 11
- REFUELLING 12
- SIGN-OFF 14
- SIGNS 10
- STORAGE 12
- TRAINING 10

SAFETY SIGN LOCATIONS **15**
SERIAL NUMBER **5**
SERVICE **27**
SERVICE RECORD **29**
SHREDDER FEED **23**
SHREDDER KNIVES **33**
SPECIFICATIONS **37**
STARTING ROPE **19**
STORAGE **26**

T

TABLE OF CONTENTS **2**
THROTTLE **19**
TORQUE **38**
TO START THE ROTOR **20**
TO STOP THE ROTOR **20**
TROUBLE SHOOTING **35**
TWIG BREAKER **34**

U

UNPLUGGING **25**

W

WARRANTY **3**